

An alternative derivation of canonical distribution as a result of irreversible processes in macrosystems

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Abstract

© 2016 IOP Publishing Ltd. This paper shows that when students are introduced to the derivation of one of the most important physical formulas - the canonical distribution - they are exposed to assumptions which may be confusing because they contradict physical reality. The paper provides an alternative derivation of the canonical distribution. Our derivation takes into account internal physical processes in macrosystems leading to the canonical distribution and does not require any physically unjustified assumptions. The article is intended for teachers and students of statistical physics, and for general physicists.

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Keywords

alternative derivation, canonical distribution, hidden internal processes in macrosystems, irreversibility, statistical physics

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